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The Relationship Of Diet And Physical Activity With The Incidence Of Hypertension In The Community In Tenga Village

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Abstract

Hypertension is a non-communicable disease that is one of the main health problems in South Minahasa Regency. Unhealthy diet and lack of physical activity are risk factors that can increase the incidence of hypertension in the community. This study aims to determine the relationship between diet and physical activity and the incidence of hypertension in the community in Tenga Village. This study uses a quantitative method with a Cross-Sectional design. The research sample amounted to 120 respondents who were people who had conducted examinations at the Tenga Health Center. Data was collected using the Food Frequency Questionnaire (FFQ) questionnaire for diet and the Global Physical Activity Questionnaire (GPAQ) for physical activity, as well as blood pressure data from the Health Center. Data analysis used Chi-Square test and multivariate analysis. The results showed that the majority of respondents were female as many as 92 people (76.7%) and ≥50 years old as many as 83 people (69.2%). A total of 99 respondents (82.5%) had hypertension, 96 respondents (80.0%) had a hypertension-triggering diet, and 97 respondents (80.8%) had mild physical activity. The results of the Chi-Square test showed that there was a significant relationship between diet and the incidence of hypertension with a value of p=0.022 and there was a significant relationship between physical activity and the incidence of hypertension with a value of p=0.034. However, the results of the multivariate analysis showed that diet (p=0.118) and physical activity (p=0.162) did not have a significant relationship simultaneously with the incidence of hypertension. The conclusion of this study shows that there is a relationship between diet and physical activity and the incidence of hypertension in the community in Tenga Village based on bivariate analysis. Therefore, the community is expected to maintain a healthy diet and increase physical activity as an effort to prevent and control hypertension.

Keywords: ***Hypertension, Diet, Physical Activity, Community, Tenga Village.***

INTRODUCTION

Hypertension is a disease known as high blood pressure in which a person's condition is to experience blood pressure beyond the normal limit, which is 120/80 mmHg. According to the WHO, the limit of normal blood pressure is less than 130/80mmHg. When blood pressure exceeds 140/90mmHg, it is said that hypertension is the limit for adults over 18 years old. Lifestyle is an important factor that affects people's lives. An unhealthy lifestyle can be the cause of hypertension, for example, physical activity, stress, and the wrong diet are one of the risk factors that increase hypertension. (Indirwan Hasanuddin, 2023).

According to the World Health Organization (WHO), hypertension is the cause of around 9.4 million deaths annually worldwide, and the number of sufferers is expected to continue to increase until 2025 (Andries et al. 2025) Where 333 million are in developed countries and the remaining 639 are in developing countries, including Indonesia. Hypertension has resulted in the deaths of about 8 million people each year, of which 1.5 million deaths occur in Southeast Asia where 1/3 of the population suffers from hypertension. Hypertension also ranks second out of the 10 most common diseases in outpatients in hospitals in Indonesia (Imelda Erman, 2021).

In 2019, the prevalence of age-standardized hypertension in the age group of 30-79 years in the world and in the Southeast Asian region was 33.1% and 32.4%, respectively. In Indonesia, based on the results of Basic Health Research (Riskesdas) in 2018, the prevalence of hypertension is 34.1%. Meanwhile, the prevalence of diabetes in the world and the Southeast Asian region was, respectively, 10.6% and 8.8% in 2021. (Ministry of Health of the Republic of Indonesia, 2023). According to data from the Ministry of Health of the Republic of Indonesia, South Kalimantan province is 44.1, West Java province is 39.6, West Kalimantan is 37.0, East Java is 36.3, West Sulawesi is 34.8, North

Sulawesi is 33.1 (Riskesdas 2018, Ministry of Health and Human Services). Health of the Republic of Indonesia 2021).

North Sulawesi Province, is one of the districts located in Sulawesi which is included in the top 10 provinces with hypertension as much as 33.12%, hypertension is one of the 10 highest common diseases in North Sulawesi. Based on research conducted in January-February 2024, the incidence of hypertension in Manado City is 41,869 cases (Ferkrindi sasombo, 2024). The incidence of hypertension is one of the highest non-communicable diseases in Bitung City and is the second city in North Sulawesi Province that experiences the most hypertension after Minahasa Regency. Hypertension is the highest non-communicable disease in South Minahasa district in the list of 10 prominent diseases in South Minahasa hypertension is the first disease, with 1,492 cases of hypertension or 6.18% of the total cases, this figure shows that hypertension is still a high health problem and needs to be prioritized for treatment (Podung et, al. 2021).

Tenga Village is part of the South Minahasa Regency area. At the Tenga Health Center, there were an average of 169-172 people who checked themselves at the Pingkan Tenga Health Center. The Pingkan Tenga Health Center is one of the first level health facilities in Tenga District which has a strategic role in the prevention of hypertension.

Some of the factors that cause hypertension are, genetics, age, gender, diet, physical activity, stress and alcohol consumption. One of the factors that causes hypertension is diet, poor diet is one of the risk factors that increase the incidence of hypertension. Modern food factors are the main contributors to hypertension. Excess fat intake results in increased fat levels in the body, especially cholesterol which causes weight gain so that blood volume experiences a greater increase in pressure.

Poor diets such as frequent consumption of high-sodium foods, fast food that contains a lot of fat, and lack of consumption of fruits and vegetables can trigger hypertension. Research shows that a good eating pattern is less likely to develop hypertension, while a poor eating pattern tends to develop type I hypertension and type II hypertension.

In coastal communities, they have a habit of consuming high-cholesterol seafood such as shrimp, shellfish, crabs, and squid which can trigger hypertension, high seafood consumption and hypercholesterolemia play a role in the tendency of hypertension in coastal areas. With the abundance of marine products, the use of salt as a preservative in salted fish increases the intake of sodium at risk of hypertension. Consumption of fried foods and coconut milk can also increase the risk of hypertension; coastal communities consume seafood with a frequency of 3 times a day with large portions Excessive and continuous consumption of foods high in cholesterol can trigger hypertension. Eating habits that have been formed for a long time are difficult to abandon or stop in people who live close to the beach. (Indriastuti, 2020).

One way to reduce the risk of hypertension is to maintain a good diet, which is to reduce fat and salt intake, and increase the consumption of fruits and vegetables. By understanding the relationship between diet and the incidence of hypertension, it is hoped that people can pay more attention to their diet to prevent and control high blood pressure. In addition to diet that causes hypertension, there are other factors that cause hypertension, namely lack of physical activity, because doing regular physical activity is beneficial in regulating weight and strengthening the heart system and blood vessels.

The prevalence of hypertension increases significantly every year due to an unhealthy lifestyle, especially a sedentary physique. Physical activity has been shown to prevent hypertension in the general population, but the evidence is limited in the young adult population.

Physical activity is broadly defined as daily exercise, work, leisure activities, and active transportation. Physical activity is any body movement that is caused by the work of skeletal muscles and increases energy expenditure. This activity includes activities carried out at school, at work. Activities in the family and household. Activities while traveling and other activities that are done to fill daily leisure time, lack of physical activity can also increase the risk of excess body fat which will cause the risk of hypertension to increase (Muhamad Kristanto, 2021).

RESEARCH METHODS

This research will use a quantitative research method, which is research conducted on a set of objects that usually aim to see what happens in a population. The research design used is cross sectional, which is a study to study the dynamics of correlation between factors and effects, by approaching, observing or collecting data (Elisa Oktavia, 2021). The place and time of the research will be carried out in Tenga Village from July to August 2025. The total population of objects studied by all people who have conducted examinations at the Tenga Health Center, Sample is the object studied and is considered to represent the Hypertension community in the Tenga Health Center area in Tenga Village.

In this study, the data taken are primary data and secondary data. Primary data is data obtained from questionnaires while secondary data is data obtained by taking data on the prevalence of hypertension in the community in Tenga village, which is as many as 120 people.

RESULTS AND DISCUSSION

This research was conducted from July to August in early 2025 after 120 respondents from the community in Tenga Village. The results of the research that have been obtained by researchers in Tenga Village regarding the relationship between diet and physical activity and the incidence of hypertension in Tenga Village.

Table 1. Characteristics of Respondents by Gender

Gender	**(n)**	**(%)**
Women	92	76.7
Male	28	23.3
Total	90	100

Based on Table 1, it shows that the frequency distribution by gender is 92 (76.7%) while 28 (23.3%) are male.

Table 2. Characteristics of Respondents by Age

Age	**(n)**	**(%)**
<50 Years	37	30.8
≥50 Years	83	69.2
Total	120	100

Based on Table 2, the frequency distribution based on the age of hypertension sufferers, which is <50 years, is 37 (30.8%) while
≥50 years old as 83 (69.2%).

Table 3. Characteristics of Respondents Based on Occupation

Jobs	(n)	(%)
IRT	88	73.3
Not working	8	6.7
Teacher	1	8
Tani	16	13.3
Self-employed	1	8
Private Employees	1	8
Retirees	5	4.2
Total	120	100

Based on Table 3, the frequency distribution by occupation shows that the most IRT 88 (73.3%), Unemployed 8 (6.7%), Teachers 1 (8%), Farmers 16 (13.3%), Entrepreneurs 1 (8%), Private Employees 1 (8%), Retirees 1 (4.2%).

Table 4. Characteristics of Respondents Based on Blood Pressure

Blood Pressure	(n)	(%)
Hypertension	99	82.5
Normal	21	17.5
Total	120	100

Based on Table 4, the frequency distribution based on the blood pressure of people with hypertension is 99 (82.5%) and normal 21 (17.5%) hypertension.

Table 5. Characteristics of Respondents Based on Diet

Diet	(n)	(%)
Good	96	80.0
Less	24	20.0
Total	120	100

Based on Table 5, the results were obtained from 120 respondents, 96 (80.0%) with a good diet, and 24 (20.0%) with a poor diet.

Table 6. Characteristics of Respondents Based on Physical Activity

Physical Activity	**(n)**	**(%)**
Lightweight	97	80.8
Medium	22	18.3
Weight	1	8
Total	120	100

Based on Table 6, the frequency distribution based on physical activity of respondents with hypertension is Mild 97 (80.8%), Medium 22 (18.3%), Heavy 1 (8%).

Table 7. The Relationship of Diet and Blood Pressure

Diet and blood pressure							
Age	Hypertension		Normal		Total		**P *Value***
	n	%	n	%	n	%	
Good	83	86.5	13	13.5	96	100.0	0.022
less	16	66.7	8	33.5	24	100.0	
Total	99	82.5	21	17.5	120	100.0	

Based on the table above, it can be seen that of the 24 respondents who had a poor diet, there were 16 people (66.7%) who had hypertension and 8 people (33.3%) who had normal blood pressure. Meanwhile, of the 96 respondents with a good diet, there were 83 people (86.5%) who had hypertension and only 13 people (13.5%) who had normal blood pressure. Overall, out of a total of 120 respondents, it was found that 99 people (82.5%) had hypertension, while 21 people (17.5%) had normal blood pressure.

The results of the statistical test using Chi-Square showed that the value p = 0.022. Because the p value < 0.05, it can be concluded that there is a significant relationship between diet and the incidence of hypertension.

Table 8. The Relationship of Physical Activity with the Occurrence of Hypertension

Physical Activity and Blood Pressure							
Age	Hypertension		Normal		Total		**P *Value***
	n	%	n	%	n	%	
Lightweight	84	86.6	13	13.4	97	100.0	
Medium	14	63.6	8	36.4	22	100.0	0.034
Weight	1	100.0	0	0.0	1	100.0	
Total	99	82.5	21	21.0	120	100.0	

Based on the table on the relationship between physical activity and the incidence of hypertension, it is known that of the 97 respondents with mild physical activity, as many as 84 people (86.6%) have hypertension and 13 people (13.4%) have normal blood pressure. In 22 respondents with moderate physical activity, it was found that 14 people (63.6%) had hypertension and 8 people (36.4%)

had normal blood pressure. Meanwhile, in respondents with heavy physical activity as many as 1 person, all (100%) experienced hypertension. Overall, out of 120 respondents, there were 99 people (82.5%) who had hypertension and 21 people (17.5%) had normal blood pressure. The results of the statistical test showed a p value = 0.034 which was smaller than α = 0.05, so it can be concluded that there is a significant relationship between physical activity and the incidence of hypertension.
These results show that the lighter a person's physical activity, the higher the risk of hypertension. In contrast, respondents with moderate physical activity had a higher proportion of normal blood pressure compared to the light activity group.

Multivariate analysis is used to correlate multiple independent variables with dependents at the same time. In addition, the analysis was carried out to determine the significant relationship between the depen and idenpenden variables, or to find out which factors or variables have the most influence on the incidence of hypertension in the community in Tenga village.

Table 9. Results of multivariate analysis of the relationship between diet and physical activity to hypertension in the community in Tenga village

No.	Variable	B	OR	OR	P value
1.	Diet	0,886	0,566	0,412	0,118
2.	Physical activity	0,744	0,533	2,105	0,162

Based on the results of the multivariate analysis in the table above, the dietary variable has a B value of 0.886 with an OR value of 0.412 and a p-value of 0.118. This shows that diet does not have a significant relationship with the incidence of hypertension because the p-value > 0.05. An OR value of 0.412 indicates that respondents with a certain diet have a 0.412 chance of experiencing hypertension compared to the comparison group. In the physical activity variable, a B value of 0.744 was obtained with an OR value of 2.105 and a p-value of 0.162. A p-value of > 0.05 indicates that physical activity also does not have a significant association with hypertension incidence. However, an OR value of 2.105 indicates that respondents with less physical activity have a 2.105 times greater chance of developing hypertension than respondents with good physical activity. Overall, the results of the multivariate analysis showed that diet and physical activity were not significantly related to the incidence of hypertension because both variables had a p-value greater than 0.05.

CONCLUSION

Based on the results of the study on the relationship between diet and physical activity and the incidence of hypertension in the community in Tenga Village, it can be concluded that the majority of respondents in this study are women as many as 92 people (76.7%) and most of them are ≥50 years old as many as 83 people (69.2%). Most of the respondents experienced hypertension, namely 99 people (82.5%). Most of the respondents had a hypertension-triggering diet of 96 people (80.0%) and the majority of respondents had light physical activity as many as 97 people (80.8%). The results of bivariate analysis showed that there was a significant relationship between diet and the incidence of hypertension in the community in Tenga Village with a p-value = 0.022 (p < 0.05). The results of bivariate analysis also showed that there was a significant relationship between physical activity and the incidence of hypertension in the community in Tenga Village with a p-value = 0.034 (p < 0.05). The results of the multivariate analysis showed that diet and physical activity together did not have a significant relationship with the incidence of hypertension because the p-value of the two variables was > 0.05, namely diet of 0.118 and physical activity of 0.162. However, physical activity had an OR value of 2.105 which showed that respondents with less physical activity had a greater chance of experiencing hypertension than respondents with good physical activity. In general, it can be

concluded that diet and physical activity have a relationship with the incidence of hypertension based on bivariate analysis, so a healthy lifestyle is very important in efforts to prevent and control hypertension in the community. (HARAHAP, 2020).

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